

## **Thermodynamic Property Model for Binary Mixtures of Methane and Hydrogen Sulfide**

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Recently, environmental problems have been discussed globally. Yielding less harmful objects than petroleum in combustion, natural gas has been given attention and its thermophysical properties are required. However it is difficult to predict its thermophysical properties because natural gas is a multi-component system whose primary component is methane and its composition varies with gas fields. For calculating the properties of natural gas with high accuracy development of equation of state (EOS) expressed by Helmholtz free energy function is required. In this study we have developed an EOS for hydrogen sulfide by a Helmholtz free energy function in the temperature range from 188 K to 760 K at pressures up to 170 MPa. Hydrogen sulfide is one of the components of natural gas. The behavior of the binary mixture methane and hydrogen sulfide is of particular interest from the point of view of researchers in thermophysical properties for fluids and fluid mixtures. LLV phase equilibrium and the divergence of the critical curve have been reported. Based on our present equation of state for hydrogen sulfide, a thermodynamic property model for the binary mixture of methane and hydrogen sulfide is now being developed.